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COAL RUSH:

A New Look At Manpower Use Needed

THE energy crisis has created a promise of increased production and efficiency for the coal industry, which has declined in many petroleum dependent countries.

Some of these countries have already switched or plan to switch to rapid coal expansion.

This rehabilitation of coal, however, means a fresh look is needed at manpower training methods and safety regulations. There are nearly 1 million accidents requiring compensation and time off work in the world's mines every year, the ILO said in a report to its Coal Mines Committee.

Meeting in Geneva recently, the experts' panel called for improved technology and better education and training to help make work in the industry safer and healthier.

ENERGY FOR CENTURIES

World coal reserves are "truly enormous," the ILO report states. They constitute 90 per cent of the world's known recoverable reserves of fossil fuels in terms of calorific power against less than 10 per cent for known reserves of petroleum and natural gas. Coal reserves are estimated at 16. 8 million million tons, of which 9. 6 million million tons are classed as identified and the remainder as hypothetical. The vast bulk of these reserves is in the USSR, the USA and China but large reserves also exist in India, the Federal Republic of Germany, Democratic Republic of Germany, Poland, Australia,

(Contd. on page 8)

RIDICULOUS RUMOURS

The Prime Minister has warned the nation against "false rumours" which were being spread to create confusion.

Addresing the general body of the Congress Parliamentary party she said rumours began from the first elections. They were always at the root of riots and disorders in the country.

She said: "In rumours ridiculous things are propagated and that causes great disharmony to the nation. For instance, about a month ago, some people from Haryana came and told Mr. Bansilal, the Defence Minister, that he was under house arrest. In order to disprove these, he toured Haryana."

"Obviously, he could not go to every part. Anywhere he could not go to, we still heard, 'No, no. It is not true. He has not toured Haryana himself.' This is the way such false rumours are being spread to create confusion."

Words To Remember

Prime Minister Indira Gandhi, speaking at the valedictory meeting of the general body of the Congress Parliamentary party, said the proposed amendments to the Constitution were aimed at meeting the developing needs of the people.

"There are bound to be lacunae in written Constitutions. As the society itself and the economic conditions change, we require necessary amendments to the Constitution.

"Even at the time of elections we had mentioned the need for change in the constitution to remove any obstacles in the way of realisation of objectives and to meet the developing needs of the people."

The constitution was sometimes misinterpreted Therefore it was necessary to space out the interpretations and hence the amendments.

Government had tried to keep a spirit of harmony and dialogue with the opposition parties here and in India's foreign policy with other countries.

There was (at the Col mbo non-aligned conference) a remarkable sense of solidarity and recognition of the fact that by working together our voice would be heard in international forums. The non-aligned movement had been strengthened in this conference.

x x x

Addressing a group of members of the International Confederation of Free Trade Unions (ICFTU), Smt. Indira Gandhi said the problem of rural unemployment would be practically solved with the implementation of the new economic programme.

"All new programmes brought about changes in the existing pattern. In carrying out these changes, we should see that those who are unable to speak for themselves are not suppressed.

"It is important to see what we do; but equally important is how we do it." Local people should be involved in rural development programme.

Construction of houses in rural areas should be on the basis of local climatic conditions.

x x x

Addressing a Teacher's Day gathering, the Prime Minister said the set of fundamental duties proposed to be incorporated in the Constitution would help in changing the attitudes and thinking of the people and in bringing about a peaceful revolution.

Fundamental duties had been incorporated in the constitutions of many nations but in this country only the people's rights had been mentioned. Mahatma Gandhi had always stressed that rights flow from duties and now a set of duties was proposed to be included in the constitution.

If students, teachers and other citizens kept these duties before them, it might bring about changes in their attitudes and thinking.

Some people were asking as to how the mere inclusion of these duties would help. It was true that this by itself

(*Contd. on page 7*)

THUS SPAKE THE MAHATMA

Without FAITH this world would come to naught in a moment. True faith is appropriation of the reasoned experience of people whom we believe to have lived a life purified by prayer and penance.

ASOKA SCENTED BETEL NUT POWDER

Free India

SUNDAY Sep. 12, 1976

P. M.'s VISIT

The emergency has provided a rare opportunity for the Congress Parties in in various States. But party units in some states seem to be riddled with rivalries.

Kerala differences were settled only recently. West Bengal leaders have visited Delhi to meet the Party President Mr. Barooah and other central leaders.

Mr. Purabi Mukherji, AICC General Secretary, in charge of Party affairs in Karnataka, will be in Bangalore to hear the State leaders "why they have not been pulling together."

The "United" Tamil Nadu Congress does not seem to be as united as it is often made out. The Madurai Unit of the Party is said to be divided into four groups. The position in other districts is not clear. The Ramachandran group in the old Congress (O) is still alive.

The Prime Minister will be touring Tamil Nadu for two days on Sept. 14 and 15. Apart from visiting drought-affected areas, she will be addressing six public meetings organised by Congress Party. The visit is timely.

This must help the Congress to build up its strength and put up a better image in Tamil Nadu.

Smt. Indira Gandhi will be addressing the Tamil Nadu Congress Working Committee meeting at Madurai on Sept. 14. We believe the opportunity will be taken to thrash out differences if any and present the party to the public as a really united force.

"We have a good programme. The emergency has given us great opportunity for fulfilling the programme. The peasants and workers all expect us to work together," the Prime Minister has reminded Congressmen.

The Communists and others and to a small extent the Youth Congress under Sanjay Gandhi seem to carry the benefits of the 20-Point programme to the people. It is doubtful if Congressmen in general are active enough to work the programme.

Indian-Born Engineers On The Mars Viking Mission

By EVERLY DRISCOLL

Landing a Viking spacecraft on the surface of Mars, 335 million kilometres away, is not easy. It takes precise navigation. Flight controllers must know at all times where the spacecraft is. A miscalculation of a few metres can later result in a miss of a thousand kilometres.

Three Indian-born engineers contributed to the vital job of precision navigation of Viking. They are Dr. Narendra P. Dwivedi, Dr. Navin Jerath and Prem Kumar—members of the Viking guidance and navigation team at the Jet Propulsion Laboratory (JPL) in Pasadena, California where the Vikings are controlled.

Dr. Dwivedi's team was responsible for the successful manoeuvre that placed both Viking spacecraft into orbit around Mars. Dr. Jerath's group, of which Mr. Kumar is a member, keeps constant track of the two Viking orbiters through a new method called "optical navigation"—a technique Dr. Jerath helped develop.

All three say the Viking experience has been one of the greatest of their lives.

EXCELLENT FEAT

Dr. Dwivedi's three-year Viking work is almost completed. His chief task was supplying them information for the manoeuvre that placed the two spacecraft into proper orbit around Mars, while using the least amount of fuel and satisfying the various scientific goals of the missions.

"The scientists could come up with some bizarre and mutually conflicting requirements. I had to study these to determine which could be done and how much it would cost in terms of fuel," he said.

Using radio signals that indicated roughly where the spacecraft was, and the data from the optical navigation supplied by Dr Jerath's team, Dr. Dwivedi calculated when the engine should be started, how long it should fire, and how the spacecraft should be pointed at the time. The goal, "a specific orbit around Mars, the correct orientation to the Sun and to the Martian surface."

The engine burns that placed the Vikings into orbit were the longest in the history of U.S. space flight—40 to 50 minutes each. The manoeuvres used two-thirds of the total fuel on board.

"The best manoeuvres are always the ones that do the job and cost the least in fuel," Dwivedi said. Viking officials wanted to retain as much fuel as possible for future manoevres, as the orbiters will continue to operate around Mars for months to come.

He calls the first landings on the surface "an excellent engineering feat. I knew all along we could do it," he said. "A lot of things could have gone wrong. The lander could have toppled. But it didn't.

INTUITIVE METHOD

"Most of the scientific accomplishments are yet to come. We have just begun to examine Mars' shape, chemistry and environment. This is the first time we have had hard information about another plant."

The lessons learned from Mars and its history can be very helpful to life on Earth, Dr. Dwivedi believes. "It will give us a new consciousness of Earth's environment. After studying what has happened to Mars, we can say, "this is something we better not do to Earth's environment."

Dr. Jerath's chief job is navigating the Vikings with optical techniques never before used operationally on a space mission. The method was tested, however, on the Mariner-9 spacecraft which orbited Mars in 1971. Dr. Jerath also worked on that mission.

"The technique is an intuitive method," he says. "We use our own eyes to navigate—to walk and move about. On Viking, we use the cameras' eyes to see our way through space."

Simply let the Viking cameras photograph Mars, or its moons (Phobos and Deimos), and the background stars. Using what the cameras see with information from the radio tracking stations on Earth, engineers such as Prem Kumar then can calculate where the spacecraft is and where it is headed.

The value of the new technique is its improved accuracy, says Dr. Jerath Using radio signals to navigate involves determining where the spacecraft is by measuring the shift in the radio waves as they travel through space. The accuracy of this method decreases the farther a spacecraft moves from Earth.

REASONS FOR ERRORS

"Radio navigation often results in errors as large as large as 100 to 300 kilometres," says Dr. Jerath. These errors are largely due to radio interference caused by solar gas that streams through space.

On Viking-2 the radio errors were even larger, due to the position of the spacecraft in relation to Earth. But by combining the radio data with the optical method, the team was able to determine where the spacecraft was to within a few kilometers. The technique has been very successful. Dr. Jerath just recently received his Ph D. from the University of California at Los Angeles: his thesis concerned his work—navigating spacecraft with radio and optical techniques.

Dr. Jerath received his undergraduate degree in mechanical engineering at the Indian Institute of Technology in New Delhi. He was born there in 1946. He received his masters degree from the California Institute of Technology, in Pasadena, and studied also at the Massachusetts Institute of

(Continued on page 7)

An Announcement

The price of FREE INDIA has remained the same for over 15 years, inspite of the steep increase in the cost of paper, ink, wages, power etc. Consequently we are constrained to increase the price of the magazine as given below. We are confident that our readers would not mind it and continue to extend their cooperation as before.

NEW SUBSCRIPTION RATES (INLAND)

Single copy	30 paise
Annual Subscription	Rs. 15/-
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FOREIGN SUBSCRIPTION (By Sea Mail)

Annual Subscription	Rs. 50/-
Half-yearly Subscription	Rs. 25/-

The New Rate Comes into Effect From Our Issue Dated 19th September 1976.

Meditation Is More Than Relaxation

THE *Gita* says that it is hard to control the mind, just as hard as controlling the wind. But if you cannot control the mind, you run great risks in that you may do silly and rash things, things for which you will be sorry later. If, for instance, somebody provokes you, you may react in a manner leading to unpleasant consequences for you and others. A man without any self-discipline is always erratic. He can seldom think or act coolly and judiciously. He acts on the spur of the moment, doing things he would not have done if he knew what he was doing. But a man having control over his mind is slow but sure and seldom makes a mistake. He is a conscientious man, always honest, straightforward, and dutiful. He is also confident, bold, and strong. The Gita says that such a person takes everything in his stride—praise or blame, fortune or misfortune, etc. Whatever may happen, he maintains his calm, his vision is clear, his judgment sound. He takes a decision after weighing all its pros and cons and once he takes a decision he never swerves from it.

But how does one get such control of oneself? Hindu scriptures say, by practising meditation. If you practise meditation regularly and in correct manner, you become your own master and cease to be the slave of circumstances that you are now. But what is meditation? And how does one meditate? Meditation is thinking thinking deeply, with deep concentration. When you fix your mind on something, that is meditation. Normally you find your mind always flitting about, but if you can keep it fixed on some object, idea or experience, you are meditating. It is as if you are pouring a liquid from one pot to another in a continuous flow. Or as if a lamp is burning in a room and there is not a whiff of wind to disturb its flame. There is yet another simile—that in which the mind is compared to a lake with a smooth surface, there being not a single ripple on it. There is a tremendous force when the whole lake is turned into a wave or a stream. Similarly, when the whole mind is applied to a task, it is more easily accomplished. The fact of the matter is that the mind is always in a state of turmoil. If by practising meditation, one can bring it under control, one can them make use of the great powers that lie hidden in the mind in whatever way one likes.

But how does one meditate? First of all, you sit in the position of a lotus with your back straight. Then, fix your mind on either a figure, word, or symbol. Whatever you choose to fix your mind on, imagine it as luminous Focus your mind on it with intensity so that you may feel as if you are one with it. Hindus believe that if you keep meditating on Buddha you eventually become a Buddha. This is where meditation excels as a character - formation technique.

There are people who say that it is immaterial what you meditate on so long as you meditate. They say that you may meditate on a nonsense word and yet get the same results from meditation. This goes contrary to the Hindu saying that you are what you think you are. Even if you are not a religious person, meditation may help you but meditation is essentially for people who are trying to achieve some religious purpose. If meditation is used for relaxation only—this is exactly how it is being used by a great many people today—you are not taking full advantage of what it can do for you.

—From the Bulletin of the Ramakrishna Mission Institute of Culture.

—

MOVED OUT

"When she recited poetry everyone was very moved."

"Yeah—towards the exit."

Voiceprint For Cheque Cards

Like the fingerprint, the human voice is unique and impossible to forge, which is more than can be said for the signature on a banker's card Banks in the Federal Republic of Germany may one day substitute a voiceprint for the signature in a bid to protect accountholders and save sevenfigure sums netted annually by forgers and swindlers.

Banker's cards incorporating metal strips may be forged, but a voiceprint is unique. The account-holder's voiceprint as stored in the Bank's computer can be compared in a matter of seconds with a print freshly recorded at the cashier's desk. Research facilities associated with the voiceprint project include the Heinrich Hertz Institute, West Berlin, and research and development are part subsidised by the Bonn Ministry of Research and Technology.

Educational Aid By Canara Bank

The Canara Bank has provided assistance amounting to over 4.60 lakhs to poor and merited students of various professional courses this year. 455 students all over the country, including 147 in Tamil Nadu, have received loan scholarships under this scheme this year. The Bank made special efforts this year in giving educational aid under the Canara Bank Jubilee Education Fund Scheme, to mark the completion of two decades of yeomn aservice in the field of educational aid.

The Canara Bank Jubilee Education Fund was started in 1956, when the Bank celebrated its Golden Jubilee, as a tribute to its Founder, A. Subba Rao Pai of revered memory. The purpose of the Jubilee Education Fund is to help bright but indigent students to continue their studies in various technical and professional courses in the degree classes.

The objectives of the fund are to promote and encourage higher education-general, technical or scientific-among the intelligent but needy students by providing financial help. Loans upto Rs. 1,250/-per year are granted to each beneficiary, with nominal interest and liberal repayment conditions. The loan scholarships are allowed to be renewed every year till the course is completed, depending on progress made by the recipients. This year the renewal of 13? scholarships has been sanctioned, involving further aid of Rs. 1.36 lakhs to boys and girls.

The Canara Bank has so far provided assistance to 1650 deserving students out of its Educational Fund. The total amount disbursed for their educational purposes has amounted to over Rs. 21.46. lakhs.

Solving Water Problem: German Efforts

DESPITE the current drought and the havoc it has wrought for farmers water boards in the Federal Republic of Germany remain fairly confident of being able to meet estimated future domestic and industrial demand for one of the most precious commodities of them all, pure water.

Annual rainfall totals 200,000 million cubic metres, of which roughly one drop in eight steps down to the water table, which varies from region to region, of course, but on balance is well provided, although this year's estimated shortfall may total between 10,000 and 15,000 million cubic metres.

Demand is expected to increase substantially between now and the end of the century, however—from 4,500 to 6,000 million cubic metres per annum in domestic consumption and from 11,000 to 22,000 million cubic metres used by industrial consumers.

PROMISING PROJECT

Yet even though less than a third of the water currently required is tapwater that must be fit to drink, supplies of pure subsoil water are already inadequate. So one litre in three is either surface water or subsoil water with an admixture of less expensive water that is not drawn from the water table.

In future regional shortfall will be offset by diverting river water in winter into reservoirs with porous beds. Hamburg water board, working in conjunction with a government-run agency in nearby Geesthacht that is best known for its work in nuclear shipping, have embarked on an even more promising project, the desalination of salty subsoil water.

By no means all subsoil water in caverns measureless to Man is pure; substantial amounts are self-evidently brackish in salt formations, although otherwise freer of impurities than seawater. The world's first desalination plant for processing subsoil water, a pilot unit handling 15,000 cubic metres a day, is now in operation near Hamburg, a city of two million people with a current total water consumption of 160 million cubic metres.

Desalination units in themselves are nothing new, of course. Seawater is desalinated to the tune of roughly 2.5 million cubic metres a year by a number of countries, most installations being based on the vaporisation principle. Hamburg's twin pilot units use two new techniques, reverse osmosis and dialysis. Running costs are eventually expected to amount to no more than a quarter of those required by conventional procedures.

The salt content of the subsoil water desalinated near Hamburg is a modest 0.5 to 1.5 per cent. Project engineers will soon be working sixty miles further north near Kiel, the Baltic port and administrative capital of Schleswig-Holstein. The water in Kiel Bay, where the annual regatta is held, has a salt count of a mere one and a half per cent and may also be desalinated before long.

—Arthur Fahrenkrug

FUN AND LAUGHTER

HIS QUERY

Teacher received her pay envelope and after extracting the money held the envelope up for the class to see.

"What is this ?" she asked, by way of a general knowledge test.

"A pay envelope, miss," said one boy.

"And what did it contain ?" she went on.

"Your salary."

"That's correct," replied the teacher. "And now has anyone any questions to ask ?"

"Please, teacher," said a little boy who had been studying the envelope in silence, "where do you work ?"

* * *

BRIGHT IDEA !

Time was when the newspaper photographer confronted by the great man who refused to have his picture taken pulled the old sob story, "If I don't get your picture the boss will fire me." But that is not todays's way.

In New York, a visiting celebrity declined to be photographed, whereupon the photographer casually replied, "That's all right, sir, I believe we have one in our files of you at some bathing beach with a blonde !"

He got the picture !

* * *

ESCAPE

Two explorers met in the jungle and were exchanging confidences over the light of their campfire.

"I came out here," said one, "because the urge to travel was in my blood. I wanted to see sun rise over new horizons, to leave my footprints on unmarked sands, see Nature in the raw. Tell me, why did you come here ?"

"Why ?" said the second explorer. "My daughter is learning to play the piano !"

* * *

ALWAYS CONSISTENT

A judge asked a woman her age.

"Thirty," she replied.

"You've given that age in this court for the last three years."

"Yes, I a'm not one of those who say one thing today and another thing tomorrow."

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DILEMMA

A widow who was no longer young once embarrassed a young man by asking him coyly, "How old do you think I am ?"

"I'm very poor at guessing age," he replied evaisvely.

"Oh, come, you must have some idea," she insisted.

"My difficulty, lady," he said "is to decide whether to make you ten years younger because of your beauty or ten years older because of your wisdom."

* * *

THE CAUSE

Father frowned as he looked over Junior's report card.

"Well, pop" explained Junior, "all the fellows in school got low grades this time."

"All of them ?" asked father. "How about the little Smith boy across the street ?"

"Well, yes, he did get high marks," admitted Junior reluctantly, "but, you see, he's different—he's got bright parents."

* * *

REPORT

A well known Royal Academician who noticed a drawing of a fish by a pavement artist asked the man what sort of fish it was supposed to be.

"A shark, Sir !"

"But you've never seen a shark" said the Royal Academician.

"That's true, Sir," the man agreed, "but then, don't some of those Academy chaps paint angels ?"

* * *

FOR WHOM ?

A small boy was being sent to summer camp, much against his will, and was making no bones about it.

"Why, you'll just love camp," his aunt said soothingly "You'll have a simply wonderful vacation."

"I won't," was the acid retort, "but my mother will."

* * *

HIS BRAG !

One evening, at a dinner in Paris, a lady remarked to the painter, Whistler, that she believed that he knew King Edward VII personally.

"No, madam," replied Whistler.

"Why," said the lady, "that s very odd, I met the King at a party last year and he said that he knew you."

"Oh," scoffed Whistler, "that's just his brag."

* * *

ONLY THINKING

A woman inquiring about a little girl's father, was told that he was very sick. The woman replied, "Oh he only thinks he's sick." Meeting the little girl several days later, she again inquired about her father. The girl replied, "He thinks he's dead."

FEELING SLEEPY

The art of evading the bore was brought to a high pitch by the late Alexander Wollcott. Once when he thought that the monologue of a certain actor had gone on about far enough, Wollcott interrupted the flow of talk.

"Excuse me, my leg has gone to sleep. Do you mind if I join it ?"

* * *

HEN-PECK

"But, my dear," bleated the poor little hen-pecked husband, "you've been talking for half an hour and I haven't said a word."

"No," snapped his wife "you haven't said anything but you've been listening in a most aggravating manner, and I'm not going to stand for it."

* * *

AN AD FROM HEAVEN

The little daughter of a newspaper editor came back from Sunday School with an illustrated card in her hand.

"What's that you have there, little one ?" the editor asked.

"Oh," said the child, "just an ad about heaven."

* * *

DEDUCTION !

A man was charged with shooting a number of pigeons, the property of a farmer. Counsel for the defence tried to frighten the farmer. "Now," he remarked, "are you prepared to swear that this man shot your pigeons ?"

"I didn't say he shot them," was the reply. "I said I suspected him of doing it."

"Ah ! Now we're coming to it. What made you suspect the man ?"

"Well, first, I caught him on my land with a gun. Secondly, I heard a gun go off and saw some pigeons fall. Thirdly, I found four of my pigeons in his pocket, and I don't think the birds flew there and committed suicide.'

* * *

TOO DEAR

An old countryman sent his young son to the village shop for an ounce of tobacco, giving him six pence. He waited. Years passed—and more years. Then one day a magnificent motor-car pulled-up beside his humble cottage door, and out stepped a prosperous-looking man.

"Well, Dad," he boomed. "I went to America, worked hard and I guess I'm rich now."

"May be," retorted the old chap curtly, "but where's my tobacco ?"

The son produced a packet from his pocket. "Here it is, Dad," he said, "but it's dearer now. You owe me three-and-six pence."

WRONG PLACE

A candidate for Parliament found himself, in the course of touring his constituency, in front of a house near which a number of children were playing. Intent on his own business, the politician stopped for a moment to chat with the comely woman leaning upon the gate. Politely doffing his hat, he asked :

"Madam, I may kiss these beautiful children may I not ?"

"Certainly," replied the lady.

When he had finished his wholesale contract he turned to the attractive woman at the gate and said :

"Seldom have I seen lovelier children. Yours madam?"

The woman blushed deeply.

"Ah, of course, they are," gallantly suggested the politician. "The little treasures, from whom else could they have inherited those blue eyes and rosy cheeks, those comely figures, and those musical voices ?"

But still the lady blushed.

"By the way, madam," said he, "may I impose upon your good nature to the extent of asking that you tell your husband that Mr. Cockrell called upon him this afternoon ?"

"I fear there's some mistake, sir, I have no husband. This is an orphan asylum."

BARGAIN

The behaviour and habits of Agatha's little Pekinese, Toby, grew worse every day. Her husband at last decided it must go. "Darling," he said, "if you will agree to give up your Pekinese I will give you the money for that fur coat you want."

Agatha agreed, but added. "This is only to please you."

The next day she announced : "Well, darling. I hope you'll be pleased—I've given up Toby."

"Here is your cheque, dear, and now tell me what you did with the little beast."

Slipping the cheque into her handbag, Agatha said "I changed him for two cocker-spaniels"

* * *

BITER BIT

When the service ended, the church organist said complacently to the old organ-blower : "I played rather well today."

"We played rather well," retorted the old man.

"I..." insisted the organist.

The argument was taken a stage further at the next service when the organist pressed the keys for the first chord and no sound came forth. Leaning towards the blower, he whispered : "Wind, please, wind !"

"Not before we get this settled," replied the organ-blower, "I or we ?"

For The Week 12th September To September 18th 1976

MESHA (ARIES)
Aswini, Bharani
Krittika 1/4

SUNDAY and Monday call for vigilance in health and money matters. In office, conditions are unchanged. At home, there is more work. Frequent worries on human relations and change in moods are likely. In speculation, there is change of unfavourable trend. You can now concentrate on improvement of official position. In finance, there is some satisfaction. Marriage affairs or some thoughts on auspicious celebration are seen. Friday & Saturday are better.

★

VRISHABA (TAURUS)
Krittika 3/4, Rohini
Mrigashirsha 1/2

THE week starts with emphasis on domestic affairs. Do not strain your relations with others. Mid week is not comfortable. Indisposition and worry are seen. Stomach upset is likely. Finance is disturbing. At home, there is friction. Opinions will differ and you should not argue. Official work is mixed. There is need for adaptability. Do not speculate. Intellectual work is emphasised.

★

MITHUNA (GEMINI)
Mrigashirsha 1/2, Arudra
Punarvasu 3/4

MOST of the week is good in an ordinary way. But, there is considerable stress in your affairs. Worries and physical strain will be felt. Expenses are very high. Health needs care. Bloodlessness is seen. Do not react emotionally. Frequent moods are seen. Human relations and financial matters call for intelligent handling. Weekend will be dull

★

KATAKA (CANCER)
Punarvasu 1/4, Pushya
Ashlesha

FROM Tuesday, the week is productive. There is scope for profitable engagement. But do not worry. Human relations are capable of producing tangible results. See your well wishers. Finance is favourable. Friends will help you. Expenses are as before. Some lucky trends will develop in profession. Promotion of your welfare is highlighted. Go ahead with your plan. This is a favourable time for those who are vigilant and painstaking.

SIMHA (LEO)
Maka, Purva Palguni
Uttara Palguni 1/4

THOUGH expenses and some physical strain may be there, do not lose courage. Avoid nervous strain. At home, keep a steady interest and work towards your objective. In office, your work will be appreciated, but for positive results some waiting may be necessary. Avoid speculation. Success over adverse circumstances is possible. If expenses are very high, you must do some planning.

★

KANYA (VIRGO)
Uttara Palguni 3/4, Hastha
Chitra 1/2

THE week starts all right But, favourable trends are a bit weak. Speculation is not advisable. While health needs care, finance and friendship will be favourable. Official and business affairs will tend to be productive. Gains are likely. Property affairs stimulate your interest. A number of factors are working and the cumulative effect is good. It is for you to be watchful and be benefited.

★

THULA (LIBRA)
Chitra 1/2, Swathi
Visakha 3/4

SUNDAY and Monday will elevate you. Official atmosphere is tolerable. But, in family, there is need for adjustment. Frequent moods and ill health are likely. Human relations may present problems. But, you can expect some success. Financial strain can be avoided by advance planning. Writing and publishing will be productive. Political and social fields are encouraging. Continue your efforts in availing opportunities.

★

VRISCHIKA (SCORPIO)
Visakha 1/4, Anuradha
Jyeshtha

MOST of the week is good in a way. Various kinds of work will attract your interest. Public relations are better. Stomach trouble and weakness are some possibilities. At home, you are pressed for funds. Take continued interest in domestic affairs. Official work is favourable. It may be difficult for you to maintain cordial relations with your kith & kin.

★

DHANUS (SAGITTARIUS)
Mula, Purva Ashadha
Uttara Ashadha 1/4

BARRING some favourable indication in profession, you will find a taxing time. Take care of health. Financial pressure, and intestinal troubles are seen. Work your way steadily for improvement in official position. Pray to God. Public relations need careful handling. Care is necessary in travel. Changes if any, should be well scrutinised before decision.

★

MAKARA (CAPRICORNUS)
Uttara Ashadha 3/4
Shravana, Dhanistha 1/2

THE week starts with prospect of gainful employment. The general condition is favourable. While finance is stiff & not satisfactory, you can carry on in official matters. In dealing with property affairs and money matters, considerable caution is necessary. Personal affairs are under stress. Your interest is not having a smooth sail. Be prepared to face domestic strain. Pray to God. Some misunderstanding will result, unless you are extremely patient.

★

KUMBHA (AQUARIUS)
Dhanistha 1/2, Sathabhishag
Purva Badrapada 3/4

THERE is nothing much to enthuse you. Feverish activity will produce nothing. Be patient and calm. Family stress will be annoying. Investments and monetary dealings are deceptive. Speculation is no good. In official matters, you may find some satisfaction. Health upset is seen. Long term planning calls for close attention. At any rate, you should pay more attention to money matters.

GLOSSARY

Arudra	—திருவாதிரை
Pushya	—பூசம்
Ashlesha	—ஆயில்யம்
Purva Phalguni	—பூரம்
Uttara Phalguni	—உத்திரம்
Anuradha	—அனுஷம்
Jyeshtha	—கேட்டை
Purva Ashada	—பூராடம்
Uttara Ashada	—உத்திராடம்
Shravana	—திருவோணம்
Dhanistha	—அவிட்டம்
Satha Bhishag	—சதயம்
Purva Bhadra-pada	—பூரட்டாதி
Uttara Bhadra-pada	—உத்திரட்டாதி

MEENA (PISCES)
Purva Badrapada 1/4
Uttara Badrapada, Revati

FROM Tuesday, the week is better. Financial strain is a general ground for discomfort. In family, you will have to face more responsibilities. Affairs of children attract your interest. Relations with your people will have to be built with care. Intellectual work will be rewarding. Your work will be appreciated. Care of health is necessary.

New Bulb Saves Energy

If Thomas Edison had fore seen today's energy crisis, perhaps he would have dreamt of a light bulb that could last a decade and use 70 per cent lese energy than conventional bulbs.

That light bulb has been invented, and will be developed over the next year under an Energy Research and Development Administration (ERDA) contract with a small company in California U.S.A.

The fluorescent "Litek" bulb resembles a 100 watt incandescent bulb, fits standard sockets, and produces a warm white light similar to the familiar incandescent bulb. Because it contains no wire filaments that can burn out, it can last at least several years and possibly a decade or more.

Preliminary studies show that full nationwide use of this new electrodeless fluorescent lamp could save the United States more than the equivalent of 500,000 barrels of oil per day.

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Muscovite's Diary

Ivan Ivanov

SOVIET COSMONAUT ON SOVIET–INDIAN FRIENDSHIP

"Soviet Union and India maintain close ties in all spheres of life and particularly it is a great pleasure for me as a cosmonaut to see expanding contacts between Soviet and Indian scientists" said Soviet Pilot-Cosmonaut Pyotr Klimuk, in an interview after his return from his recent tour of India. He recalled that India's first satellite "Arya Bhata" was launched with the help of a Soviet booster in April, 1975. He visited India last month to take part in the Friendship Month which was celebrated in different parts of the country. He is the Vice-President of Soviet-Indian Friendship Society.

Pyotr Klimuk said that the peoples of the USSR and India entertain friendly relations and mutual respect towards each other. "This was demonstrated once more by the Soviet–Indian Friendship Month which was held in the USSR in August" he added.

The Friendship Month was held to mark the fifth anniversary o the Soviet–Indian Treaty and the 29th Anniversary of India's Independence. Public meetings, art exhibitions, cultural evenings and film shows devoted to the Soviet–Indian friendship were held in Moscow, Leningrad and other cities.

It may be recalled that Pyotr Klimuk has been to outer space twice. In 1973 he made a space flight as commander of the Soyuz–13 space craft, and last year he made the longest ever manned flight aboard the space station "Salyut"–63 days.

* * *

STOREHOUSE OF SCENTS

A friend has been telling me of a visit to what he calls "the most curious storehouse he's ever seen".

It's in Sudak, in the Crimea, on a state farm near a famous "valley of roses".

He found a carpet of rose petals—about ten tons, a day's harvest—spread on the floor of a vault like a section of an underground train tunnel, kept at a temperature of 54°F.

The vault would hold more, but it seems that if the layer is more than six inches thick the petals "smother themselves" and spoil the end product, attar of roses.

The main thing is to trap the scent, not let it evaporate.

The thick, oily liquid distiled from the petals is poured into litre bottles, corked and capped. Then each bottle is wrapped in cotton wool and each batch packed in metal boxes.

This is certainly an industry where quality, not quantity counts.

A tiny plastic phial may contain the essence of a score of rose bushes, and a whole season's output can be dispatched on a single plane.

* * *

HOSPITAL FOR BALLERINAS

The Institute of Injuries and Orthopaedics in Moscow has a special clinic which treats injuries and ailments of ballerinas, athletes, gymnasts and soccer, tennis and ice-hockey players.

The "Sports and Ballet Clinic" as it is popularly called, has in its time treated ballet dancers Plisetskaya and Vasilyev, gymnasts Turishcheva and Korbut, ice-hockey players Shadrin and Yakushev, and tennis–player Metreveli.

It is headed by Zoya Mironova who before devoting herself to medicine was for many years the Soviet woman speed–skating champion.

She went to Montreal for the recent Olympics, both in her professional capacity and as a sports fan.

It costs a great deal to run the clinic, but all treatment, as at all Soviet hospitals, is free.

* * *

THE VIRTUES OF GARLIC

People the world over fall into two classes—those who like garlic and those who loathe it.

A doctor friend of mine is firmly on the side of the former.

Back in the '30s, it seems, it was found that garlic (and a few other plants) contained phytocides, which is Greek for plant-killers — substances, usually volatile, which stop the growth of germs and funguses.

In most cases, if you chop one of these plants up, the phytocides cease to be lethal within a matter of minutes; but garlic is an exception: the effect lasts for days.

Phytocides kill, or at least give a nasty shock to, many disease germs, including those which cause cholera, typhoid, gangrene and dysentery.

In a recent experiment, my friend tells me, microbes were grown in a special medium till there were 50 million per millilitre.

But when a pinch of grated garlic was introduced, every single one was dead within half an hour.

With garlic that had been kept in a refrigerator for four months, the slaughter still proceeded, but took twice as long.

Focus On Family Planning

RUNNING FAST TO STAND STILL?

Countries like Malaysia, Singapore, China, Sri Lanka and Korea have achieved notable success in shorter time in carrying the message of family planning and in making people accept the philosophy.

India adopted the policy of family planning in 1952; after 24 years of effort only about 17.5 million couples out of a total of 103 million in the reproductive age group of 15 to 45 years have accepted contraceptive devices.

Without a check on population growth, the entire national effort is being frustrated, no matter how much the development.

The Diabetic Beagle

Munich (DaD)—Diabetes specialists at Schwabing Hospital, Munich, have abandoned ideas of designing an artificial pancreas to replace the gland that no longer supplies the body with its daily dose of insulin. Miniaturisation and the immune response are too problematic, they feel, although they wish US specialists the best of luck in their work along these lines.

What the Munich medics, headed by Professor Hellmut Mehnert and Dietrich Hepp, have in mind is 'controlled infusion' or the creation of an insulin stockpile under the diabetic's skin. It will be years before the project delivers the goods, as it were, but all concerned are confident that a daily dosage administered in this way will render diabetes far less dangerous than at present.

Gerd, the pride of the research unit, is a diabetic beagle who carries his stockpile of insulin in a kind of rucksack strapped to his back. His daily dose is administered automatically. Further research is needed before the dose can be varied automatically too, but Gerd is by means the only beneficiary of the basic principle. Intravenous infusion has also been tried out successfully on human guinea pigs.

The advantage of Gerd's rucksack, which has already been reduced to the size of a cigarette packet, is that insulin injections are no longer needed. Instead of the daily jab an intravenous supply of concentrated harmone is administered.

Accustoming the diabetic to concentrated insulin is important because of the long-term objective, that of stockpiling, or inserting the 'cigarette packet' or something smaller under the skin. Periodic refills present no problem. Preeise dosage, on the other hand, is all-important because overdoses of insulin can cause damage to the blood vessels. —Albert Balzer

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Her Pin Money

Despina Papadopoules, the wife of the former, Greek dictator, who was sentenced to life for his doings, was recently haled to court too. Like her husband, the former final lady of the dictatorial regime in Athens worked for the Asphalia, the secret police, under his command. But even when Papadopoules became Premier she continued to receive a salary from the Asphalis secret police $20,000 a year. Mrs. Papadopoulos tried to convince the judges that as the Premier's wife she worked in the Asphalia department collecting foreign political information. The court sentenced her to 25 months in prison.

— —

Shark Psychosis

The Turin newspaper "Stampa" writes that fear of sharks is gripping the beaches of Italy. Holiday-makers are not the only ones who are scared. The service personnel and the police are afraid too. What's happened? This question is answered in the paper by a psychologist. He blames the spreed of this psychosia on the American horror film "Jaws" which is now being shown in Italy. The same thing happened during the show of this picture in the United States. The only ones unaffected by "shark psychosis" are the Italian fishermen. "Such sharks do appear off the shores of Italy at this time of the year," they say. "We catch and sell them."

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might not change every person, but if these were kept in mind, it might bring about a change in the people's attitudes.

If these duties remained in the minds of every citizen, "we can bring about a peaceful and friendly revolution."

The government wanted to give the teacher a high place in the society. It was the teacher who moulded the thinking of the youth, who in turn had to build the nation's future.

Despite best effots, it had not been possible to fully solve all the difficulties of the teaching community, because in a big country like India the problems were also big.

Only two years ago India faced many problems but the people have faced the difficulties with great courage. This was perhaps 'because India's has been a history of trials and difficulties in which the people had always shown great tolerance.

It was because of the people's courage that this country had come out of the period of darkness to some extent.

India was marching along the path chosen at the time of Independence, and the attempt today was to give full meaning to Swaraj and to inculcate high ideals among the youth.

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Technology in Boston. While a graduate student, he received the American Institute of Astronautics and Aeronautics "Outstanding Achievement Award ."

Dr. Dwivedi received his bachelors degree in engineering from the Musaffarpur Institute of Technology, Muzaffarpur, Bihar, India. He received his master's degree from Texas A. and M. University in College Station, Texas, and his Ph.D in electrical engineering at Auburn University in Alabama. While at Auburn, Dr. Dwivedi became involved in the U.S. space programme.

SPACE SHUTTLE

In 1969 he went to work for TRW Systems, an aerospace firm in Houston, Texas, next to the L.B. Johnson Space Center. He was a member of the guidance and control systems department for the Apollo landings on the moon.

He won the National Aeronautics and Space Administration's Lunar Landing Award for his work with the Apollo. Dr. Dwivedi was then transferred to the Jet Propulsion Laboratory in Pasadena, in 1971. His first job was analyzing the flight path for the Mariner spacecraft that will be launched in August 1977 to Jupiter and then on to Saturn. The two spacecraft will also pass by 11 of those planets' 23 Moons.

He was soon drafted, however for the job of getting the Vikings into Martain orbit.

Prem Kumar is now completing his two years of work at JPL. In September, he will enter the University of Texas at Austin to work on his Ph. D. in aerospace engineering. His goal? 'To work on the U.S. Space Shuttle,' he says.

The Shuttle is a reusable vehicle that will take off like a rocket and land like an airplane. On September 17, 1976, the first production model of the Shuttle's orbiter will be completed and rolled out of the assembly building. The first unmanned tests of the orbiter will begin in February, 1977.

The first manned tests in May, 1977. If all goes well, the Shuttle will start operations in 1979—and Prem Kumar will be there working with the programme.

FORCED TO SIT

Judy: When she sang, the audience was glued to their seats.

Trudy: That's the only way she could have kept them there.

Export Of Betelnuts And Leaves

A sizeable amount of foreign exchange is earned by India through export of betel leaves and betelnuts. In 1975-76, the export realisation was of the older of Rs. 7 million.

A quantity of 249,433 kg. betel leaves was exported by India to The U. K., Dubai, Nepal, Abu Dhabi, Bahrein, Kenya, Kuwait, Muscat and Saudi Arabia.

Betelnuts are exported in three forms ground, split and whole. The major export, however, is in the form of whole betelnuts. The foreign exchange earned by these exports was over Rs. 3.34 million (296,923 kg.)

Besides betelnuts and leaves, India also exports many other varieties of vegetable seeds and plants used in perfumery such as, agarwood, kuth-root, psyllium husk and seed, senna leaves and parts, and tamarind seed and seed powder.

Senna leaves and pods are also picking up demand abroad. Tamarind seed and powder were mainly supplied to Japan. U.S.A., France, Iraq, Kenya and Netherlands.

An Artifical Liver-- Today And Tomorrow

By M. KARLOV

MANY mechanisms have been created to save lives: artificial kidneys, artificial blood circulators, and artificial lungs. Experiments are now under way to create a man-made heart. But life constantly poses new and pressing tasks, one of which is the creation of an artificial liver.

A huge factory would be needed to reproduce by ordinary industrial methods the thousands of chemical reactions and transformations performed by the liver, an organ weighing a mere 1.5 to 2 kg. Its functions are varied—metabolism, digestion, blood circulation and blood-building. The liver destroys and synthesises certain substances, helps the body dispose of others and deactivates toxic sunstances that are either introduced into the organism or produced by it.

Should the work of this "laboratory" be disrupted by some ailment, the danger of hepatic insufficiency arises; and if medical aid is not administered in time the result may be hepatic coma, a condition when the organ is unable to carry out its functions. Finally, death ensues as the body is poisoned by the toxic substances the diseased liver is unable to deactivate.

SOLUTIONS

Scientists have proposed various methods of combating diseases of the liver. One suggestion was to replace the diseased organ temporarily with the liver of an animal. This "foreigner" will function in the patient's body for several hours, thus relieving the load on the patient's liver and giving the human liver a chance to renew its functions. Prof. Eduard Galperin, who is specialising on this problem here, believes this method to be promising. However, the surgery involved is difficult and still risky.

Another solution has now presented itself—transplantation of the liver from one man to another, as is done, for example, with kidneys. Researchers are ready to accept this method, but the surgical techniques have still to be perfected. Besides the problem of biological incompatibility, common to all transplantation surgery, tremendous technical difficulties exist. The few attempts at liver transplanting which have been made in various countries have unfortunately ended in failure.

Finally, a third suggestion is to create an artificial liver. A group of doctors and engineers headed by Academician and USSR State Prize-winner Yuri Lopukhin and Prof. Mikhail Molodenkov are now working on this. An operation was performed in 1970 at the Clinical and Experimental Surgery Department of the Second Moscow Medical Institute, using a new artificial liver apparatus. This was the first such operation on a case of acute hepatic in medical history.

"So far, our artificial liver is far removed from the real organ," says Prof. Molodenkov. "Our model carries out only one, albeit important, function of the liver—the removal of dangerous substances from the body. But the first step is always the hardest. Since that first operation in 1970, more than 100 others have been performed with our apparatus in cases of serious liver damage. In the future—exactly when is still hard to say—an artificial organ will be created that will reproduce all or at least several functions of the liver. Many medical and technical institutes and laboratories are working on this in cooperation with us. In fact, people working in more than 20 areas, including doctors, engineers, chemists, biophysicists, biochemists and mathematicians are participating."

NEW APPARATUS

The new apparatus consists basically of plexiglass tubes filled with an adsorbent (activated coal or ion exchange resins). Venous blood is diverted through a system of synthetic tubes and and passes through the absorbent which filters out toxic substances. It is then channelled back into the patient's body. This method is used just prior to an operation or, in some cases, instead of an operation. If surgery is still called for, the liver has the advantage of having "rested". Haemosorption, as the method has come to be called, is employed in cases of hepatic insufficiency, toxic hepatitis and other serious diseases that threaten to be fatal.

As a building is put together from individual bricks, so the ideal artificial liver of the future will be developed from individual discoveries. Some new methods, such as plasmosorption, are already, being used in Prof. Molodenkov's department. It was discovered that when the blood passed through the absorbent, not only were toxic substances filtered out, but the erythrocytes and thrombocytes suspended in the blood were destroyed. In the new model, which works on the principle of a centrifuge, the incoming blood is divided into several streams. The erythrocytes and other blood-building elements go along a separate channel, bypassing the adsorbent, while the plasma passes through it, is filtered and reunited with the other components of the blood.

A new apparatus already in use in Molodenkov's clinic corrects the potassium content in the blood during an operation, thus fulfilling one more task of the liver. Step by step, the work is going on to create an apparatus that will make further inroads against disease.

Film News In Pictures

Muthuraman appears as Lord Krishna in a brief scene in Sarada Arts "Mazhai Megam". It is directed by A. S. Prakasam.

Sivaji Ganesan and Manjula in the Tamil film "Avan Oru Charithiram."

From Page 1

Japan, Yugoslavia, United Kingdom and other countries.

"Coal provides the potential for meeting the world's energy needs for centuries, long after reserves of other fossil fuels have been exhausted," the report says.

"Whether this happens, of course, depends largely on the long-run development of non-fossil sources of energy such as nuclear and solar enery.'

PRODUCTION TARGETS INCREASING

Many coal-producing countries are substantially expanding output because they not only reduce dependence on foreign oil but because at current prices coal can compete with petroleum for a large number of uses.

The United States government is encouraging the conversion of electric utility power plants from oil to coal. It is estimated that US coal production will reach 800 million tons by 1980 compared with less than 600 million tons in 1972.

The USSR is perhaps the only country which has not dethroned the "black gold" in recent years of oil euphoria. Instead, it continued to raise its coal production steadily. By 1980 it will have increased again from today's 700 million tons to 790 810 million tons, according to recently adopted guidelines for national economic development. The guidelines also call for an intensified introduction of unmanned coal extraction techniques in the industry.

Britain plans an increase of 42 million tons of new capacity by 1985, reversing the trend whereby coal output fell from 184 million tons in 1960 to about 120 million tons in 1974. Poland for its part has adopted a five-year plan to increase coal output from 162 million metric tons in 1974 to 200 million tons by 1980. There are similar plans in other countries.

Realisation of these targets calls for improved technology and mechanisation in production and handling, increased capital investment and a better trained and perhaps larger labour force. The ratio of surface to underground mining is expected to rise. But as the report states :

"New underground mines require several years to develop and, although strip mining requires less time, there are a number of bottle-necks, including those arising from laws for the protection of the environment and legal delays, the availability of mining machinery, problems of transport, and problems of manpower including training and the difficulty of providing support facilities to bring workers and their families to under populated areas."

It goes on to stress that there are already problems in recruiting and maintaining even the reduced labour force for the modern mechanised systems of mining and that the danger of a shortage makes it essential to use man-power efficiently.

NEW TRAINING NEEDS

Employment is likely to rise in countries planning a major increase in coal production. This in turn means that from the training stand-point there will be a need for a higher level of skills and supervisory and managerial capacity. This poses problems everywhere, but more so in developing countries. Increasing mechanisation means greater skill requirements and all coal-producing nations will have to either expand or establish suitable training institutes.

"The new demand for coal makes it probable that training in advanced countries will be developed greatly through co-operation between governments, employers and trade unions", the report states. In all countries, however, economic prospects for the coalmining industry have changed for the better, which means the ratio of benefits to costs may well increase for employers. "These favourable developments should facilitate greatly expanded efforts by the coalmining industry to develop human skills, which are its most important asset."

STRESS ON SAFETY

Safety and a reduction in accidents are accorded top priority because "in spite of the strong pressure for increased safety for miners, nowhere in the world is the position entirely satisfactory," the report notes.

"In certain cases, the level of accidents seems to have reached a plateau and is stubbornly resistant to the usual methods of lowering it," it adds.

"Falls of ground are the major hazard, followed by haulage and transport and then miscellaneous accidents. Surface mining also suffers badly from accidents with plant and machinery."

PROPOSALS

New and more stringent dust standards, however, have led to a reduction in the incidence of pneumoconiosis, the main mining disease.

Winding up its Geneva session the Coal Mines Committee urged the ILO to renew its efforts on behalf of miners, especially in the following problem areas :

* A standard agreement for the assessment of airborne dust in mines and threshold limits ;
* A general safety strategy for safe working over a given period;
* Participation of workers in promoting safety activities ;
* Educating workers to conform strictly to safety rules ;
* National standards for training and retraining ;
* International standards for the training of foreign workers ;
* Helping workers in low-opportunity jobs to be trained for better positions ;
* Expansion of technical co-operation programmes for the less developed countries.

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